

Interoperable Map Software (IMS)

Linda Mallery

National Imagery and Mapping
Agency/SRME

Phone: (301) 227-3293

Email: malleryl@nima.mil



Background

- ◆ February 1994 ASD/C3I tasked DMA to standardize MC&G support applications for the C3I community.
- ◆ Eliminate stovepipe developments and redundant applications.
- ◆ Create, populate, and sustain an MC&G software reuse library.
- ◆ Provide guidance to users on what mapping software to use.



Interoperable Map Software

Basic Issue

- ◆ There is currently no effective Joint control over MC&G exploitation software or algorithms
- ◆ The effects are:
 - proliferation of redundant software and algorithms
 - potential compromise of data integrity
 - no guaranteed repeatability of operations between systems



Interoperable Map Software

Basic Issue (cont'd)

- less interoperability
- unnecessarily high training/ familiarization costs resulting in high costs and lowered confidence



Interoperable Map Software Objective

- ◆ Provide the best certified and proven MC&G exploitation software available to achieve greater interoperability by providing a common, consistent view of the warrior's battle space across service lines while conserving scarce DoD resources.



Interoperable Map Software Goals

♦ Joint effort

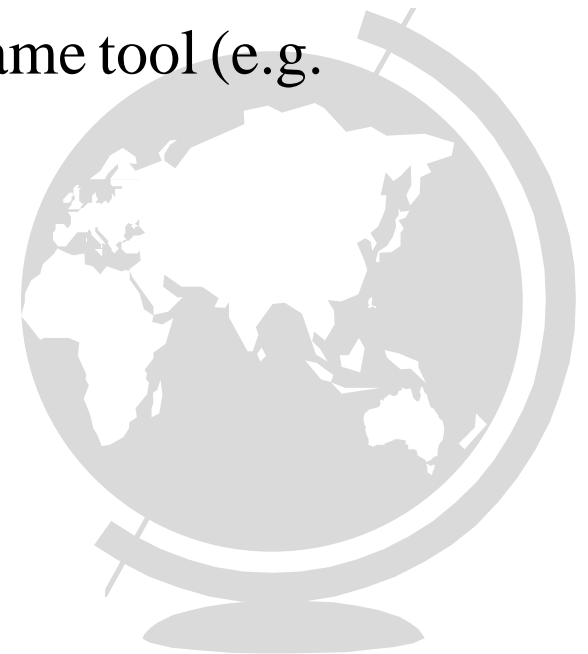
- Reduce MC&G exploitation software lifecycle costs
- Improve interoperability of DoD systems that use digital MC&G data
 - ♦ Promote use of standardized tools (e.g. line of sight, data importers, etc.) within a common computing environment



Interoperable Map Software

Goals (cont'd)

- Certify MC&G software
 - ◆ At various levels (e.g. conformance, reuse, performance, interoperability, portability)
 - ◆ Level of effort based on risk (e.g. hazards to navigation, targeting)
 - ◆ May have different versions of the same tool (e.g. speed vs. accuracy)



Interoperable Map Software Goals (cont'd)

- ♦ Institutionalize MC&G software reuse and sustainment within DoD
 - Make MC&G software reuse simple
 - ♦ Easy to find, extract, and reuse
 - ♦ Market its benefits and sell the early success stories
- ♦ Provide useful & reliable reusable assets



Interoperable Map Software

What is it?

- ◆ Infrastructure/environment in which procedures and methodologies place assets into a reuse library/repository.



Interoperable Map Software

What it's Not!

- ◆ IMS is not a system and does not build software or toolkits.



Interoperable Map Software

How to make it Happen?

- ◆ Perform requirements analysis
 - Domain Analysis
 - Assess the existing MC&G support applications
- ◆ Establish a Domain Architecture
- ◆ Establish certification process
- ◆ Establish IMS MC&G Library (s/w, tool kits (GCCS-JMTK, etc.), documentation, test cases, etc.)



Interoperable Map Software Status

- ◆ IMS Concept of Operations (draft)
- ◆ Reference Model (development with SEI)
- ◆ Domain Analysis Working Group (DAWG)
- ◆ COTS Market Survey
- ◆ GOTS vs. COTS
- ◆ Legal Issues
- ◆ Strategies and tools for establishing software reuse library infrastructure
 - faceting scheme



Interoperable Map Software Status

- ◆ DPPDB (Dew_Drop)
 - Accuracy testing
 - Pilot Project to develop certification process
 - ◆ Reqms Doc, Dew_Drop s/w Test plan, Dew_Drop Validation Report (in work)
- ◆ Certification Program Plan
 - Risk Assessment Methodology
- ◆ IMS PMP/IP (in work)



Interoperable Map Software Team

- ◆ NIMA
- ◆ U.S. Army Topographic Engineering Center (TEC)
- ◆ U.S. Air Force Electronic Systems Center (ESC)
- ◆ Naval Research Laboratory (NRL)



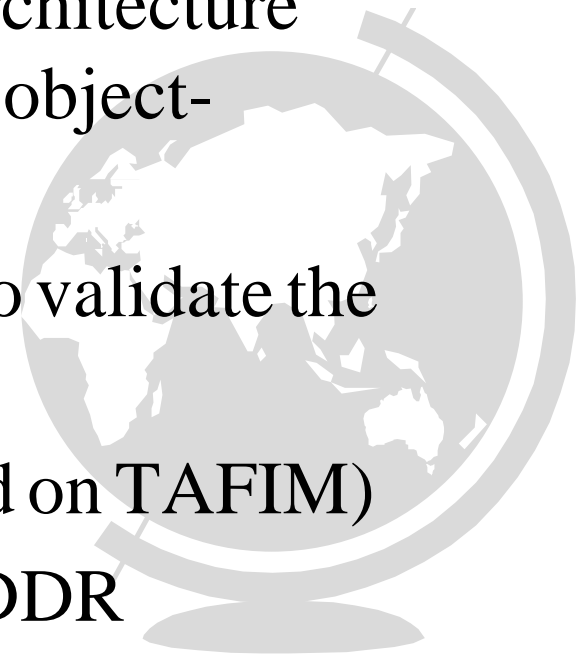
Interoperable Map Software Team (cont'd)

- ◆ Comprehensive Approach to Reusable Defense Software (CARDS) , an USAF sponsored program
- ◆ Joint Interoperability Test Command (JITC)
- ◆ U.S. Army Reuse Center



Interoperable Map Software Requirements Analysis

- ◆ Domain Definition Report (DDR), product of the DAWG
 - Scope of MC&G capabilities across all the military services
 - Created Domain Requirements Architecture (DRA) (a.k.a. object model) using object-oriented techniques
 - Developed operational scenarios to validate the DRA (model)
 - Technical Reference Model (based on TAFIM)
 - Formal Service Validation of the DDR



Interoperable Map Software Program Structure

- ◆ IMS Oversight Group
- ◆ IMS Requirements Group
- ◆ IMS Design Group
- ◆ IMS Implementation Group



Interoperable Map Software Oversight Group

- ◆ Establish Corporate process/structure
- ◆ Develop CM Plan
- ◆ Market IMS Program/Customer Support
- ◆ Determine/Establish Collection of Metrics
- ◆ Establish Customer Interface
- ◆ Provide IMS Training
- ◆ Establish Interfaces to GII IPT, USIS, CIIF



Interoperable Map Software Requirements Group

- ◆ Establish Formal Process
 - Identify/assess existing and future
 - Coordinate/finalize collection process
- ◆ VPF Slice
- ◆ Datum Transformations and Coordinate Conversions Slice



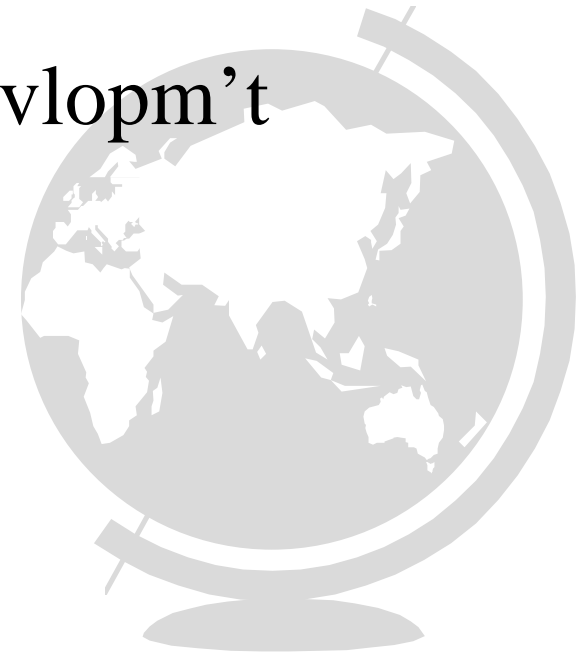
Interoperable Map Software Design Group

- ◆ Architecture, Standards, & Conventions
 - Standards profile - JTA, TAFIM
 - Constraints
 - ◆ DII COE compliant, COTS vs. GOTS
 - API standardization
- ◆ Certification Program Plan
 - Pilot Project - Dew_Drop
- ◆ Develop Software Guidelines



Interoperable Map Software Implementation Group

- ◆ Develop IMS Home Page
- ◆ Provide IMS Library Management
 - develop library, repository, handle COTS
- ◆ Provide Asset Support
- ◆ Provide Certification Factors Developm't
- ◆ Provide Certification
- ◆ Provide Validation



Interoperable Map Software Implementation Group (cont'd)

◆ Proof of Concept

– IMS Library

◆ Moreplus

– Library structure

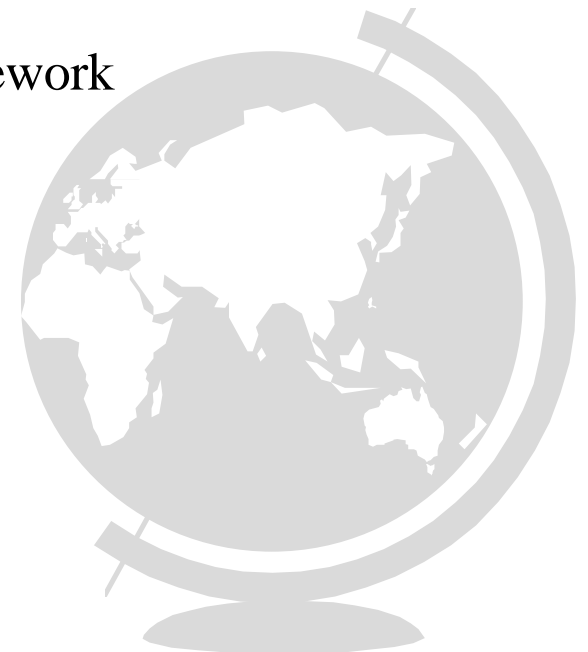
- Browsing
- User interface, architectural framework

– Home Page

– CM Plan

– Standards Profile

– IMS Certification Program Plan



Interoperable Map Software Proof of Concept (cont'd)

– Procedures

- ◆ Asset Submission
- ◆ Abstract Guidelines
- ◆ Metrics
- ◆ Requirements Submission to Repository
- ◆ Coding Guidelines
- ◆ Staffing Plan
- ◆ Repository Maintenance
- ◆ MOAs
- ◆ COTS



Interoperable Map Software

Proof of Concept (cont'd)

– Schedule

- ◆ Dry Run (Dec'96)
- ◆ Briefing and Demo to NIMA Mgmt and Service Reps (Jan'97)



Interoperable Map Software

Next Steps?

♦ Definition of IOC (due 29 Nov)

- Schedule
- Milestones
- Deliverables
- Assumptions
- Pros/Cons
- Resources

